Fig. 1

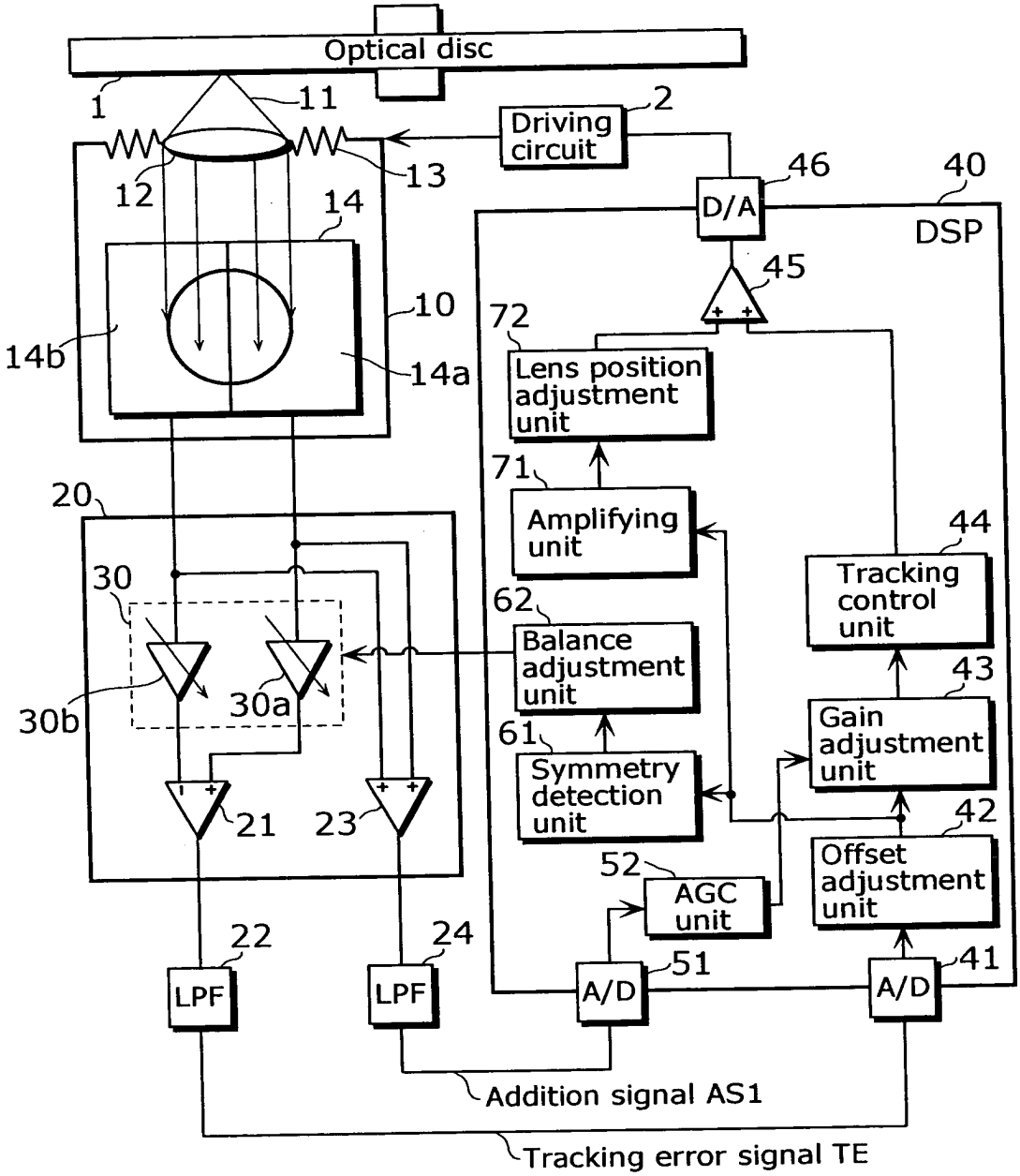

Optical disc
1
11
2
Driving circuit
12
13
46
D/A
40
DSP
14
45
10
72
14b
14a
Lens position adjustment unit
71
20
Amplifying unit
44
Tracking control unit
30
62
Balance adjustment unit
43
30b
30a
Gain adjustment unit
61
Symmetry detection unit
42
21
23
Offset adjustment unit
52
AGC unit
22
24
51
41
LPF
LPF
A/D
A/D
Addition signal AS1
Tracking error signal TE

Fig. 2

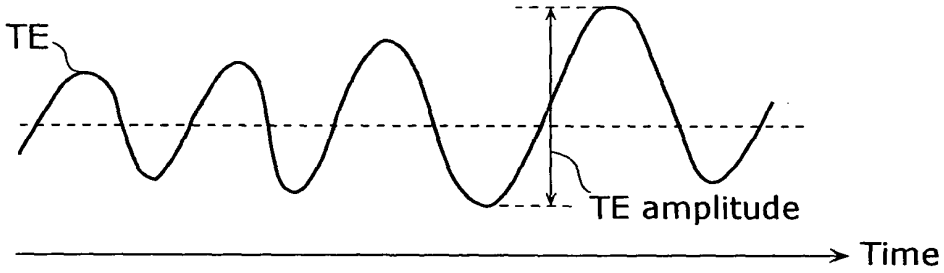



Fig. 3

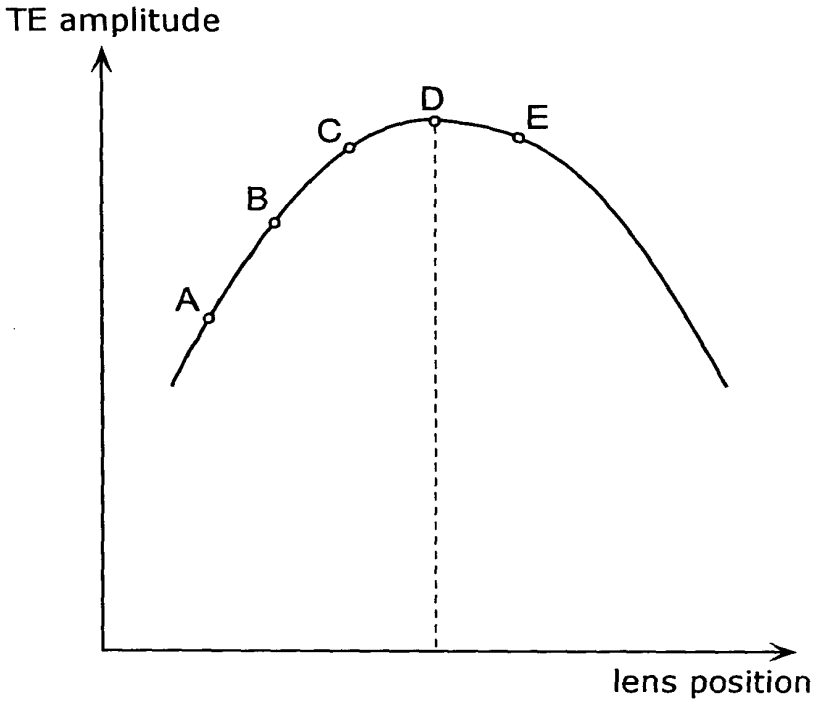


Fig. 4

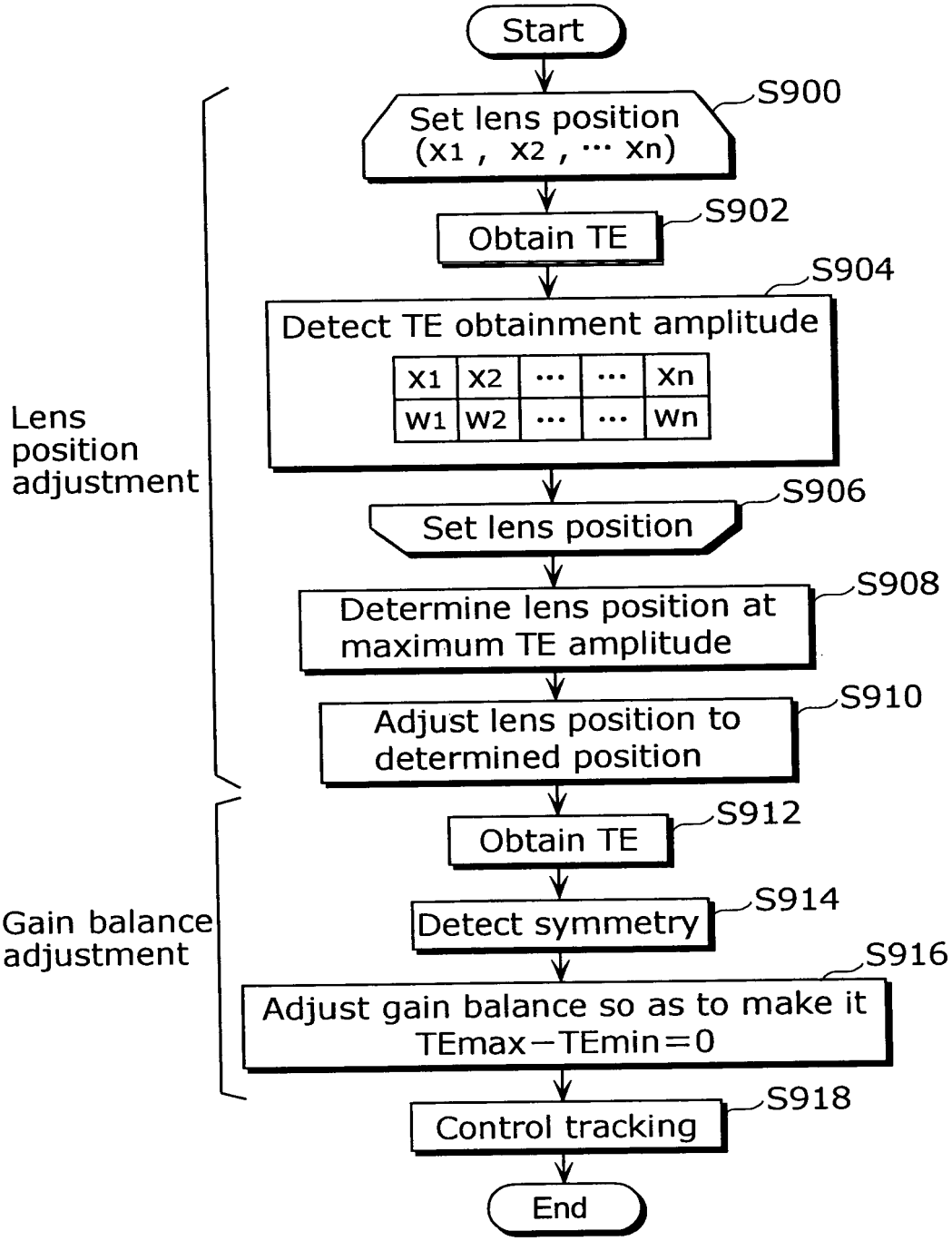

Start
Set lens position (x1 , x2 , ··· xn)
S900
Obtain TE
S902
Detect TE obtainment amplitude
S904
x1 x2 ··· ··· xn
w1 w2 ··· ··· wn
Set lens position
S906
Determine lens position at maximum TE amplitude
S908
Adjust lens position to determined position
S910
Lens position adjustment
Obtain TE
S912
Detect symmetry
S914
Adjust gain balance so as to make it TEmax−TEmin=0
S916
Control tracking
S918
End
Gain balance adjustment

Fig. 5

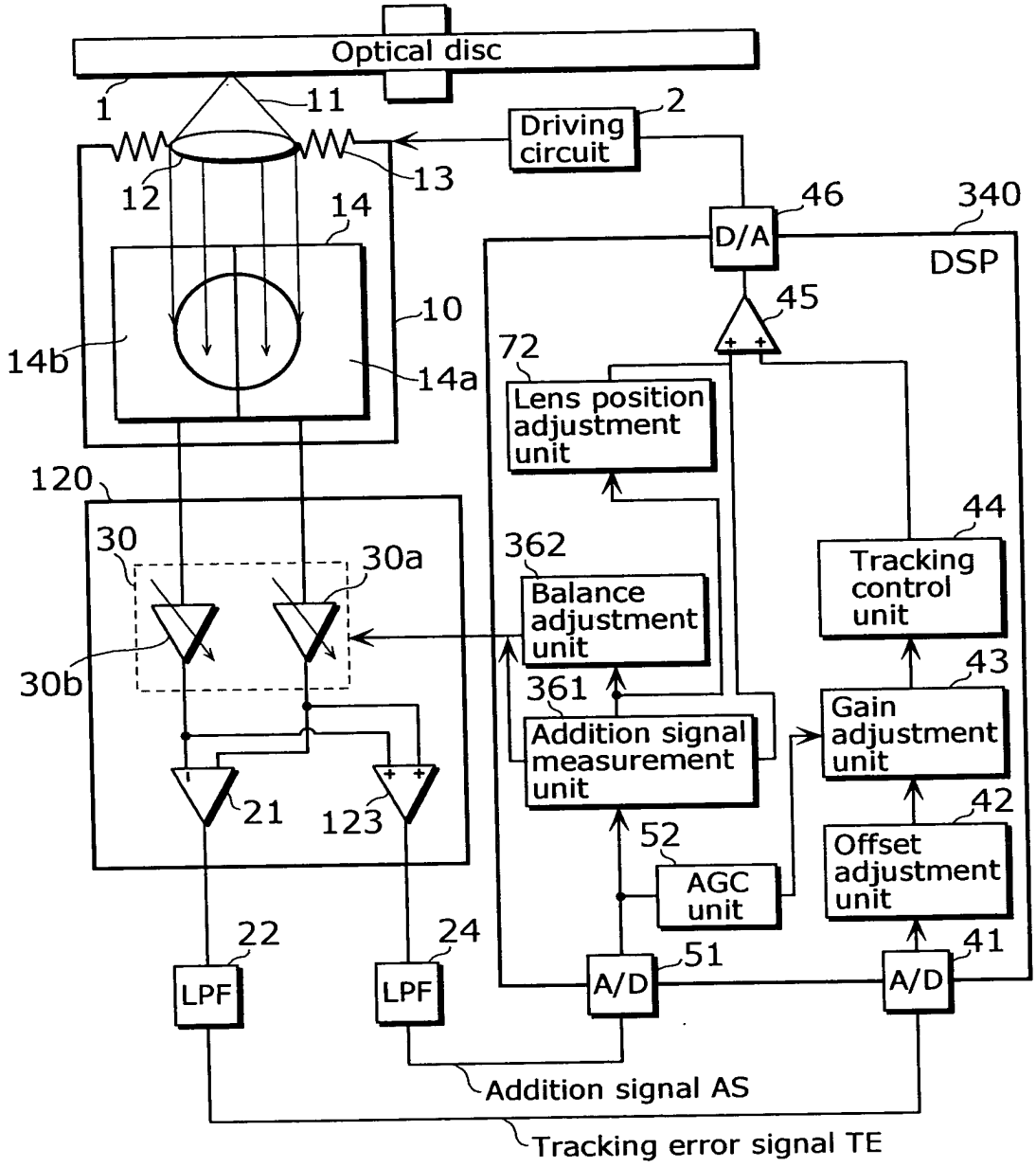

Optical disc
1
11
2
Driving circuit
12
13
14
46
340
D/A
DSP
45
10
14b
14a
72
Lens position adjustment unit
120
30
30a
362
Balance adjustment unit
44
Tracking control unit
30b
361
43
Addition signal measurement unit
Gain adjustment unit
21
123
52
42
Offset adjustment unit
AGC unit
22
24
51
41
LPF
LPF
A/D
A/D
Addition signal AS
Tracking error signal TE

Fig. 6

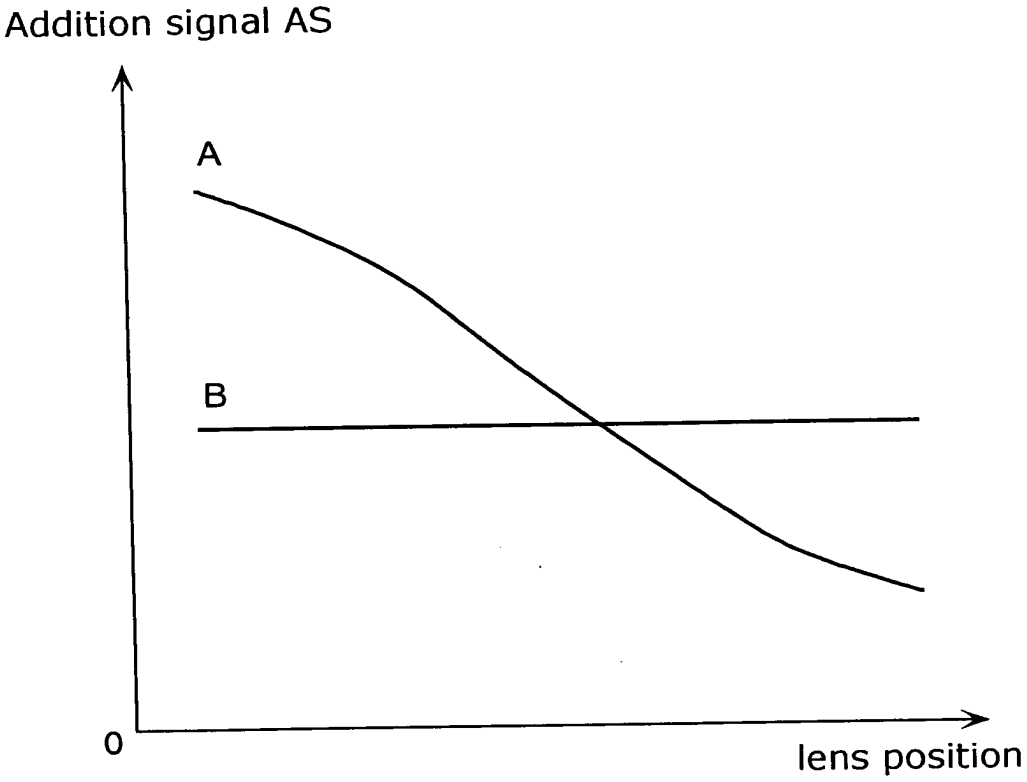


Fig. 7

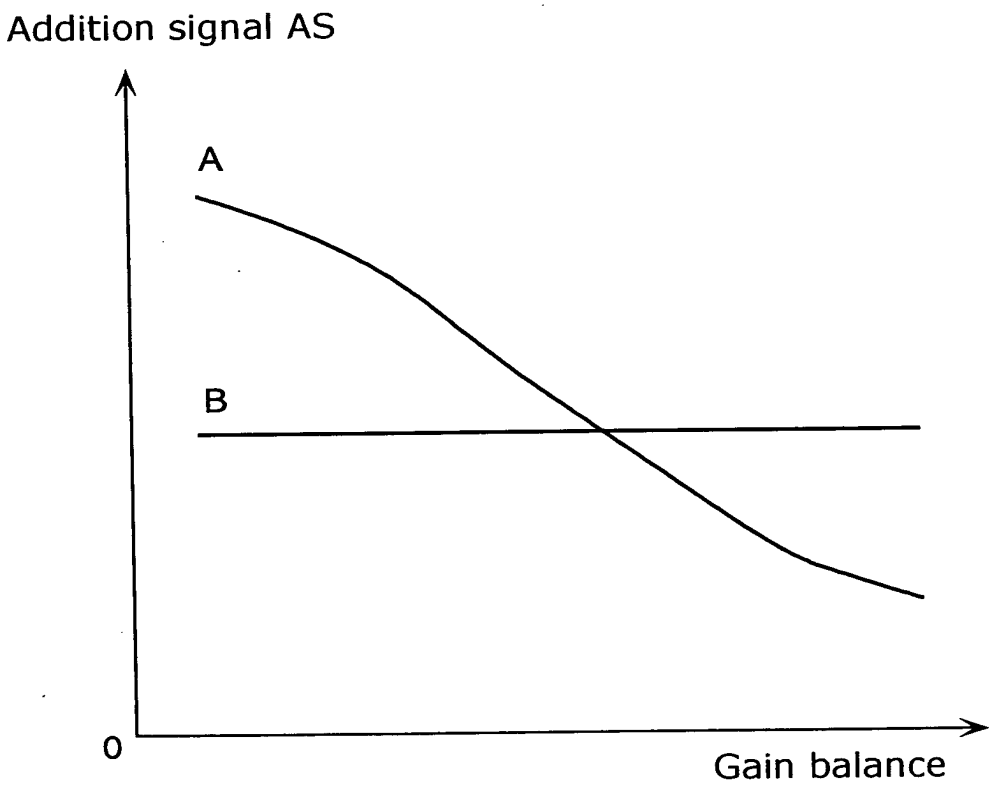


Fig. 8

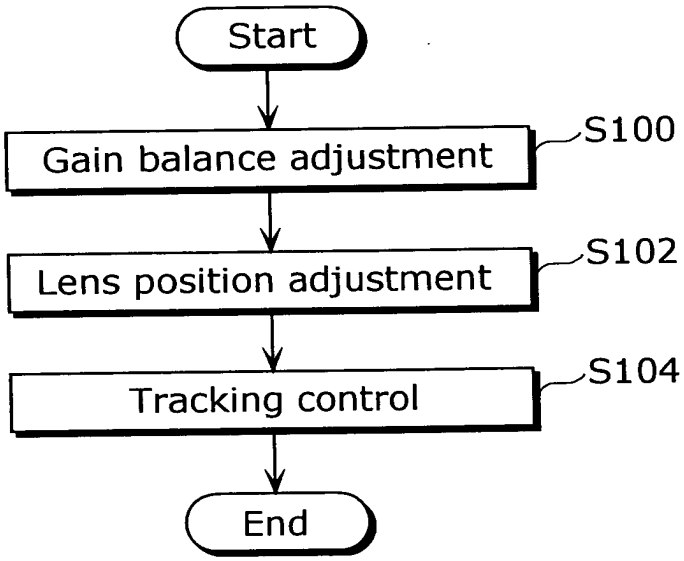
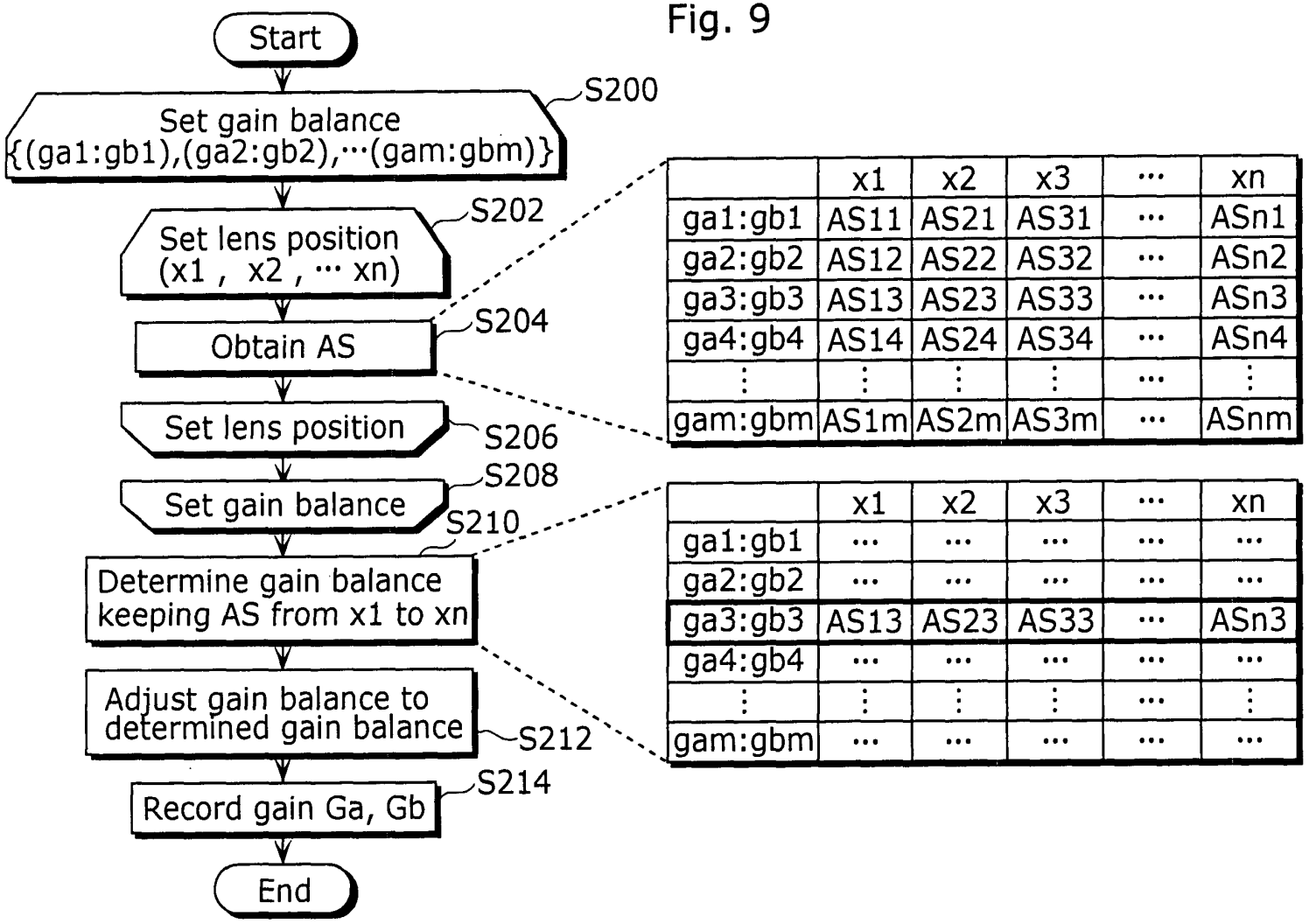

Start
Gain balance adjustment
S100
Lens position adjustment
S102
Tracking control
S104
End

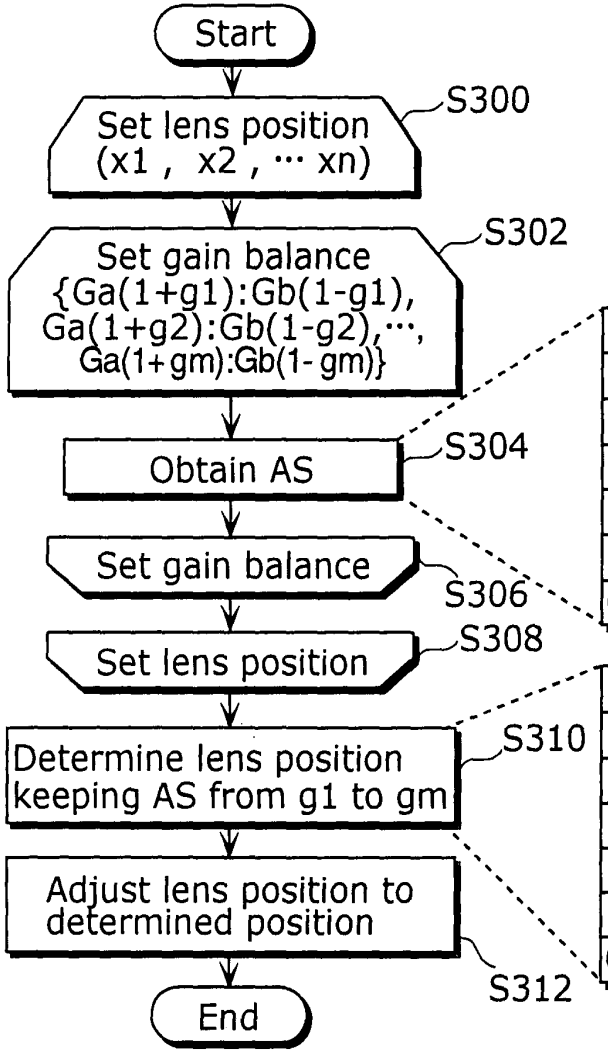
Fig. 9




| | x1 | x2 | x3 | ··· | xn |
|---|---|---|---|---|---|
| ga1:gb1 | AS11 | AS21 | AS31 | ··· | ASn1 |
| ga2:gb2 | AS12 | AS22 | AS32 | ··· | ASn2 |
| ga3:gb3 | AS13 | AS23 | AS33 | ··· | ASn3 |
| ga4:gb4 | AS14 | AS24 | AS34 | ··· | ASn4 |
| ⋮ | ⋮ | ⋮ | ⋮ | ··· | ⋮ |
| gam:gbm | AS1m | AS2m | AS3m | ··· | ASnm |

| | x1 | x2 | x3 | ··· | xn |
|---|---|---|---|---|---|
| ga1:gb1 | ··· | ··· | ··· | ··· | ··· |
| ga2:gb2 | ··· | ··· | ··· | ··· | ··· |
| ga3:gb3 | AS13 | AS23 | AS33 | ··· | ASn3 |
| ga4:gb4 | ··· | ··· | ··· | ··· | ··· |
| ⋮ | ⋮ | ⋮ | ⋮ | ··· | ⋮ |
| gam:gbm | ··· | ··· | ··· | ··· | ··· |

Fig. 10




| | x1 | x2 | x3 | ··· | xn |
|---|---|---|---|---|---|
| Ga(1+g1):Gb(1-g1) | AS11 | AS21 | AS31 | ··· | ASn1 |
| Ga(1+g2):Gb(1-g2) | AS12 | AS22 | AS32 | ··· | ASn2 |
| Ga(1+g3):Gb(1-g3) | AS13 | AS23 | AS33 | ··· | ASn3 |
| Ga(1+g4):Gb(1-g4) | AS14 | AS24 | AS34 | ··· | ASn4 |
| ⋮ | ⋮ | ⋮ | ⋮ | ··· | ⋮ |
| Ga(1+gm):Gb(1-gm) | AS1m | AS2m | AS3m | ··· | ASnm |

| | x1 | x2 | x3 | ··· | xn |
|---|---|---|---|---|---|
| Ga(1+g1):Gb(1-g1) | ··· | AS21 | ··· | ··· | ··· |
| Ga(1+g2):Gb(1-g2) | ··· | AS22 | ··· | ··· | ··· |
| Ga(1+g3):Gb(1-g3) | ··· | AS23 | ··· | ··· | ··· |
| Ga(1+g4):Gb(1-g4) | ··· | AS24 | ··· | ··· | ··· |
| ⋮ | ⋮ | ⋮ | ⋮ | ··· | ⋮ |
| Ga(1+gm):Gb(1-gm) | ··· | AS2m | ··· | ··· | ··· |

Fig. 11

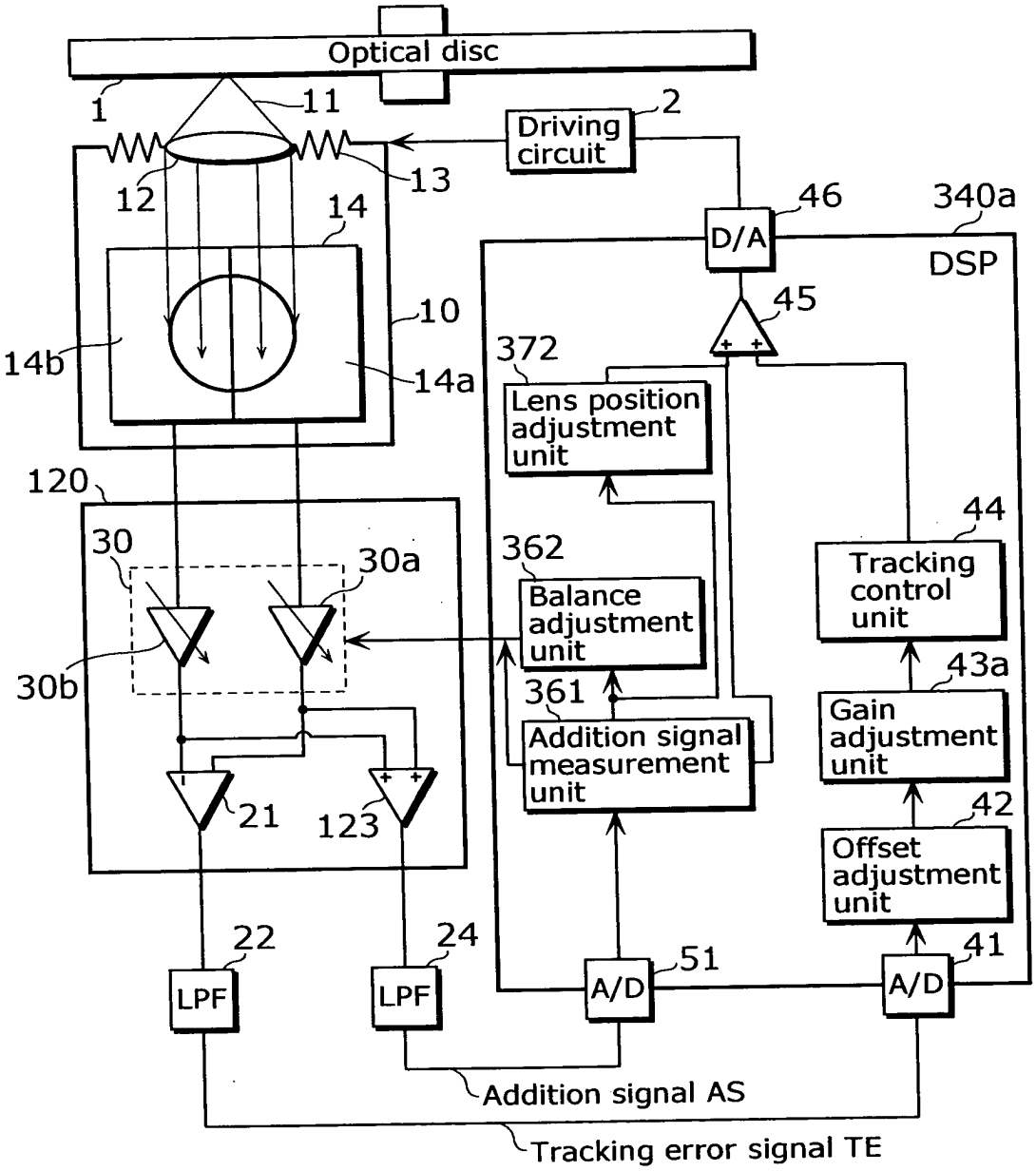

Optical disc
1
11
2
Driving circuit
12
13
14
10
14b
14a
46
340a
D/A
DSP
45
372
Lens position adjustment unit
120
30
30a
362
Balance adjustment unit
44
Tracking control unit
30b
361
Addition signal measurement unit
43a
Gain adjustment unit
21
123
42
Offset adjustment unit
22
24
51
41
LPF
LPF
A/D
A/D
Addition signal AS
Tracking error signal TE

Fig. 12

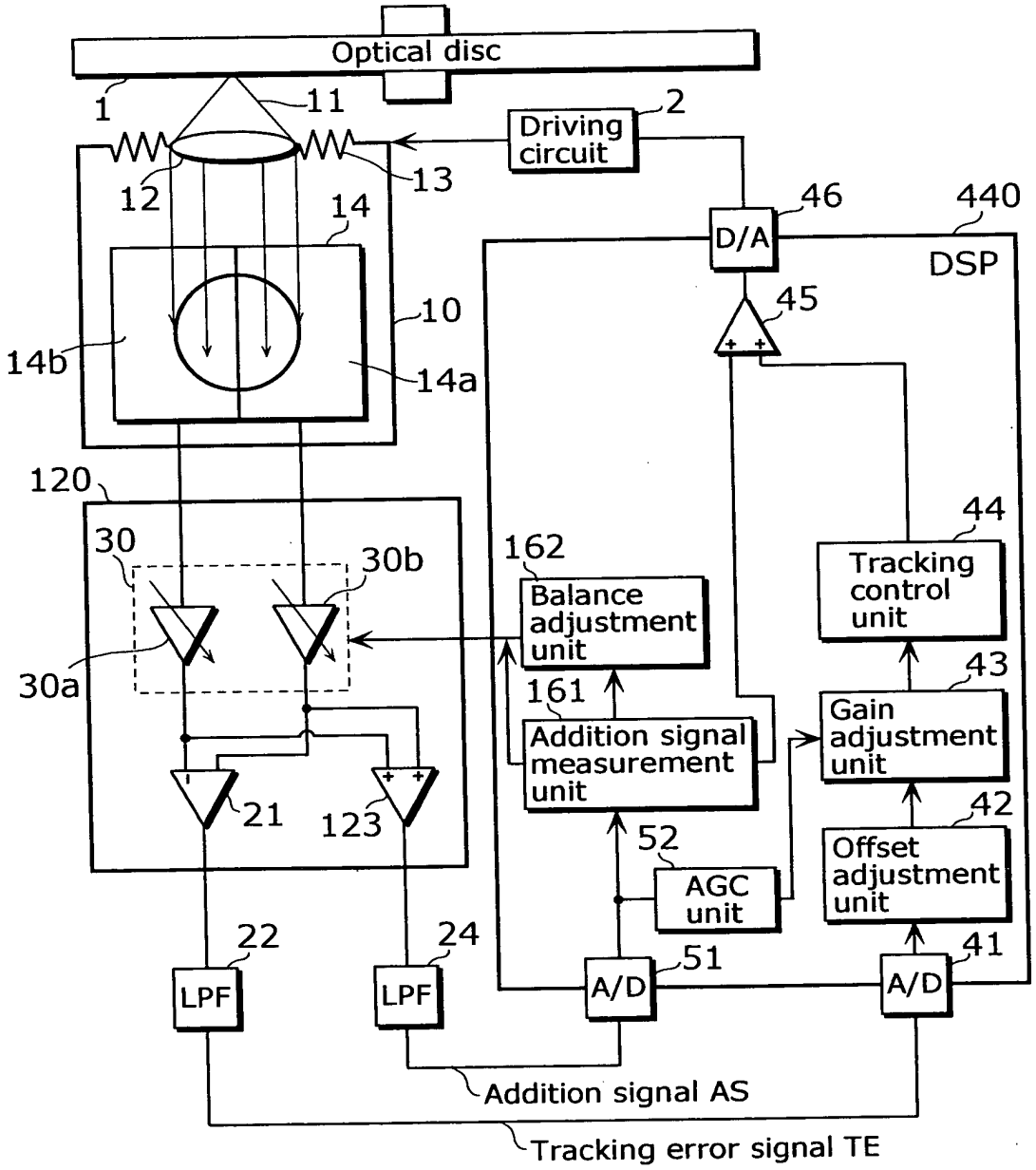

Optical disc
1
11
2
Driving circuit
12
13
14
46
440
D/A
DSP
45
10
14b
14a
120
30
30b
162
44
Balance adjustment unit
Tracking control unit
30a
161
43
Addition signal measurement unit
Gain adjustment unit
21
123
42
52
Offset adjustment unit
AGC unit
22
24
51
41
LPF
LPF
A/D
A/D
Addition signal AS
Tracking error signal TE

Fig. 13

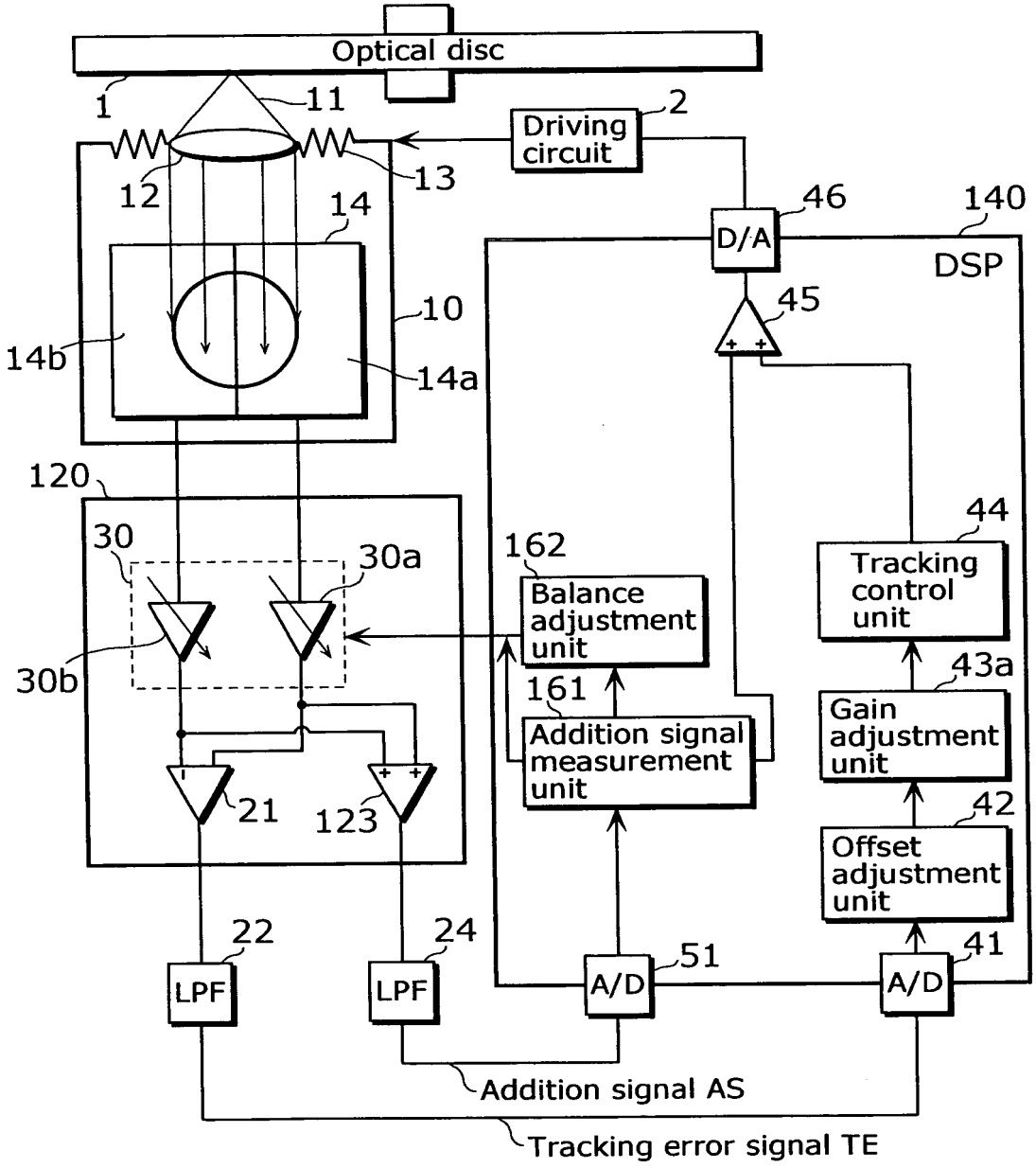

Optical disc
1
11
2
Driving circuit
12
13
14
46
140
D/A
DSP
45
10
14b
14a
120
30
30a
162
Balance adjustment unit
44
Tracking control unit
30b
161
43a
Addition signal measurement unit
Gain adjustment unit
21
123
42
Offset adjustment unit
22
24
51
41
LPF
LPF
A/D
A/D
Addition signal AS
Tracking error signal TE

Fig. 14

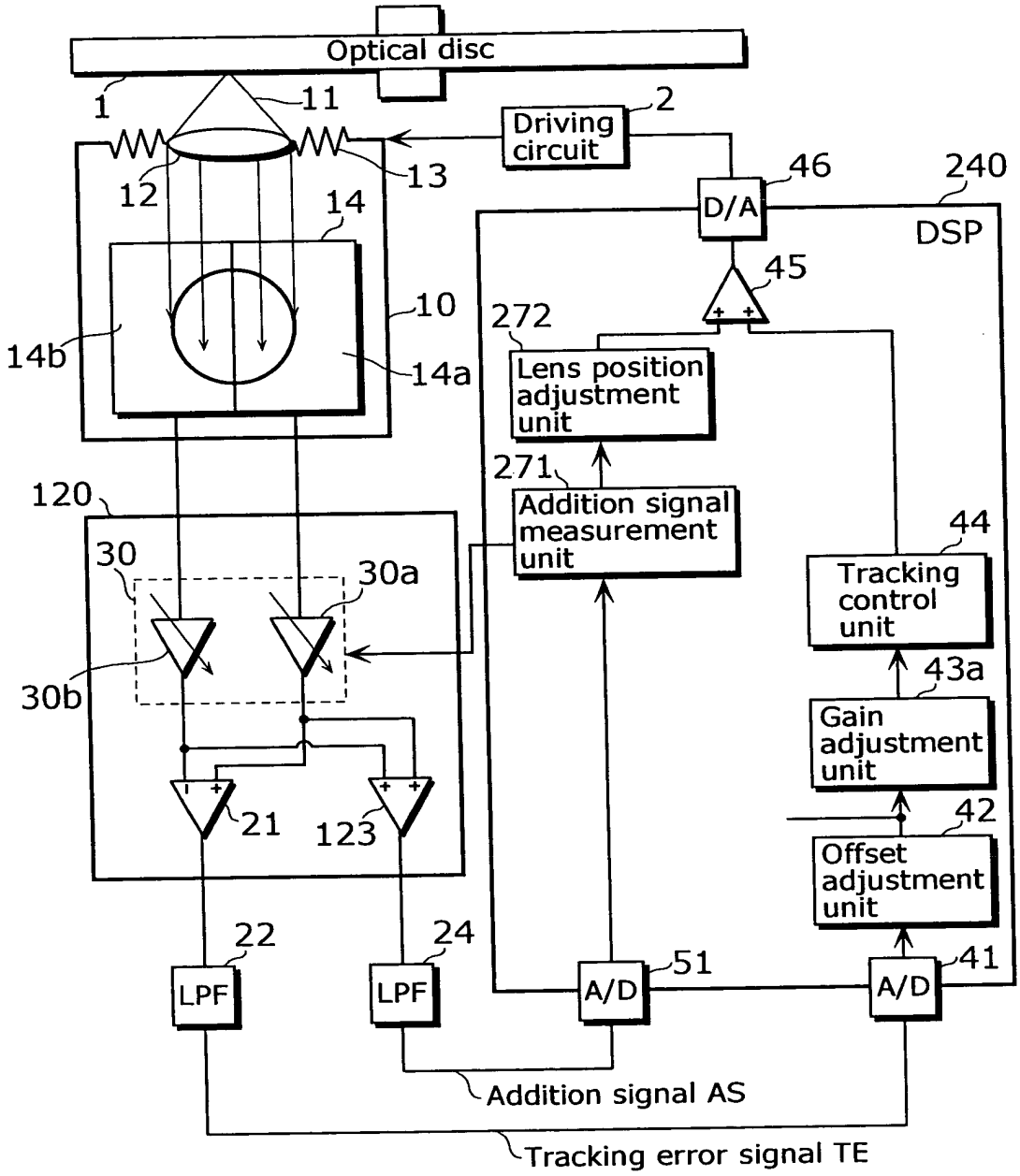

Optical disc
1
11
2
Driving circuit
12
13
14
10
14b
14a
46
240
D/A
DSP
45
272
Lens position adjustment unit
271
Addition signal measurement unit
120
30
30a
30b
44
Tracking control unit
43a
Gain adjustment unit
42
Offset adjustment unit
21
123
22
24
LPF
LPF
A/D
51
A/D
41
Addition signal AS
Tracking error signal TE

Fig. 15

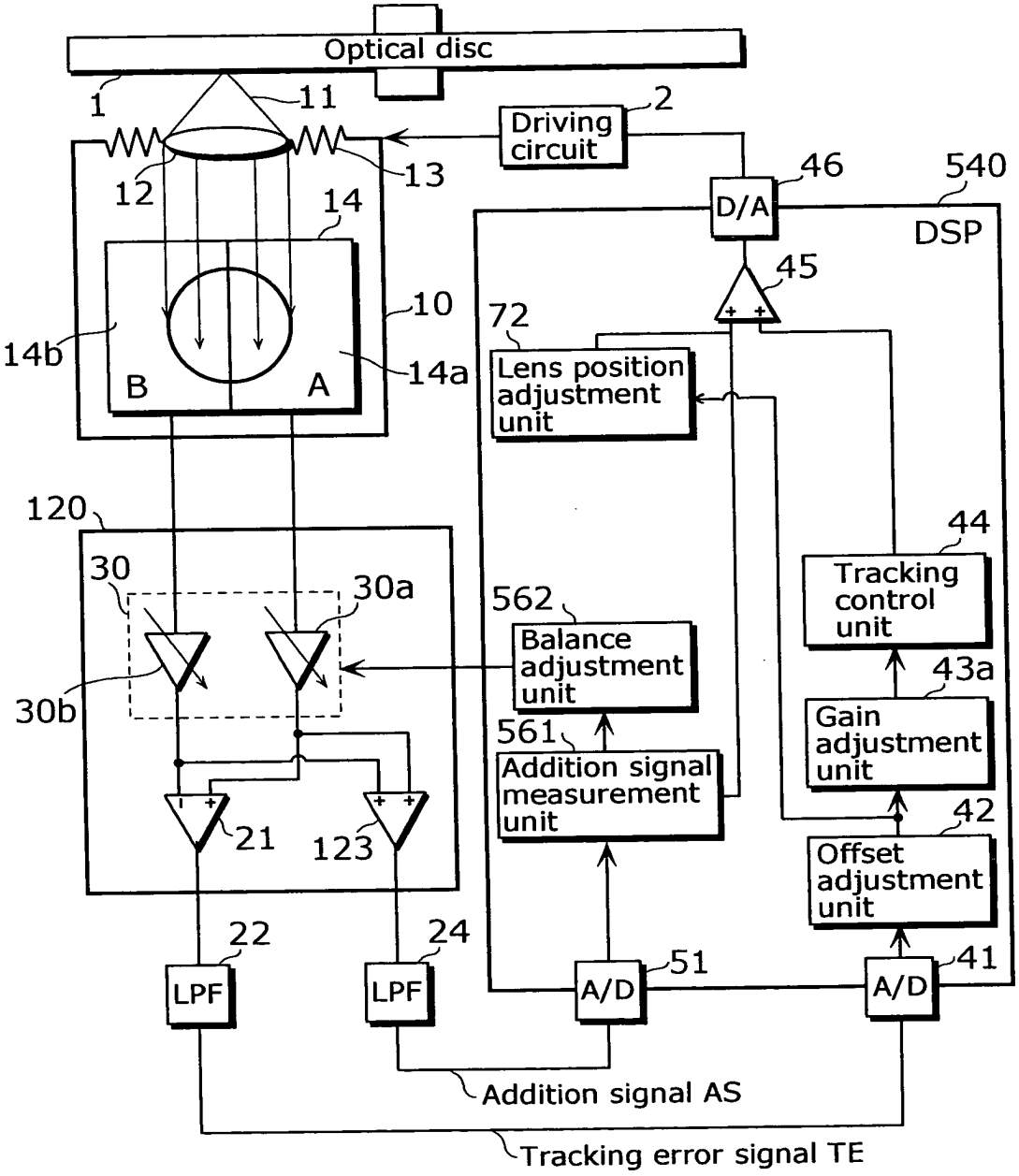
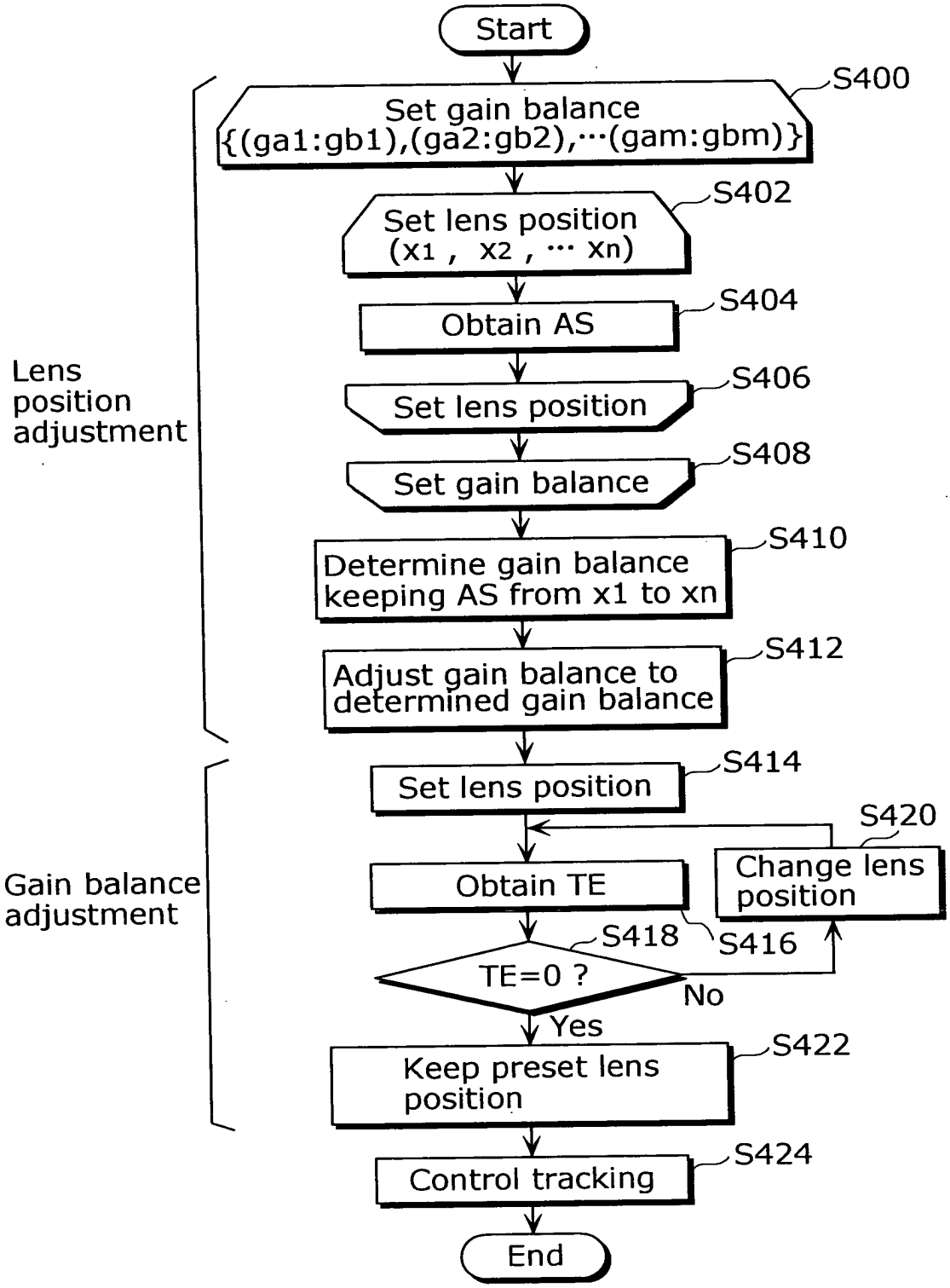

Optical disc
1
11
2
Driving circuit
12
13
14
46
540
D/A
DSP
45
10
72
14b
14a
B
A
Lens position adjustment unit
120
44
30
30a
562
Tracking control unit
Balance adjustment unit
43a
30b
561
Gain adjustment unit
Addition signal measurement unit
42
21
123
Offset adjustment unit
22
24
51
41
LPF
LPF
A/D
A/D
Addition signal AS
Tracking error signal TE

Fig. 16


Start
S400
Set gain balance
{(ga1:gb1),(ga2:gb2),…(gam:gbm)}
S402
Set lens position
(x1 , x2 , … xn)
S404
Obtain AS
S406
Set lens position
S408
Set gain balance
S410
Determine gain balance keeping AS from x1 to xn
S412
Adjust gain balance to determined gain balance
Lens position adjustment
S414
Set lens position
S420
Change lens position
Obtain TE
S416
S418
TE=0 ?
No
Yes
S422
Keep preset lens position
S424
Control tracking
Gain balance adjustment
End